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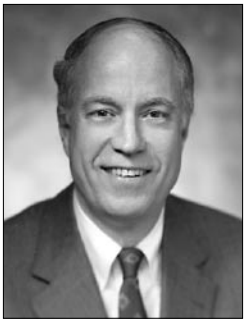


William C. Roberts, MD

SCIENCE MADE EASIER

Bill Bryson, the author of 10 previous books, has come up with another brilliant one entitled *A Short History of Nearly Everything* (1). Bryson visited many of the world's most profound scientific minds—covering subjects such as geology, chemistry, paleontology, astronomy, and physics—to make the answers to major questions in those areas comprehensible to most of us. He attempted to describe not only some of the major questions in each of these areas but also how the answers were derived. Every page is fascinating. Two examples follow.

Earthquakes and volcanoes

The chapter "The Fire Below" covers earthquakes, which are fairly common. Every day somewhere in the world, there are on average 2 earthquakes of magnitude ≥2.0 on the Charles Richter scale. Although they tend to cluster, notably around the rim of the Pacific Ocean, earthquakes can occur almost anywhere. In the USA, they have occurred at some time in all but 3 or 4 states. The most common types of earthquakes are those where 2 plates meet, as in California along the San Andreas Fault. As the plates push against each other, pressure builds up until one or the other gives way. In general, the longer the interval between quakes, the greater the pent-up pressure and, thus, the greater the scope for a really big jolt.

This is a particular worry for Tokyo, which stands on the boundary of 3 tectonic plates in a country already well known for its seismic instability. In 1995, the city of Kobe, 300 miles west of Tokyo, was struck by a 7.2-magnitude quake, which killed 6394 people and cost an estimated $99 billion in property damage. On September 1, 1923, Tokyo was hit by what is known as the Great Kanto quake, an event 10 times more powerful than Kobe's earthquake. Two hundred thousand people were killed. Since that time, Tokyo has been quiet, so the strain beneath the surface has been building for 80 years. Eventually, it is bound to snap. In 1923, Tokyo had a population of about 3 million. Today, it is approaching 30 million.

A rare type of earth shaking, known as an intraplate quake, is even more unnerving in that it can occur anywhere at any time. These quakes occur away from plate boundaries, and that is what makes them wholly unpredictable. They come from a much greater depth and tend to propagate over much wider areas. The most notorious of such quakes ever to hit the USA was a series of 3 in New Madrid, Missouri, in 1811 to 1812. The first started after midnight on December 16, when people were awakened by the noise of panicking farm animals (the restiveness of animals before quakes is not an old wives' tale but is well established though not understood) and then by an almighty rupturing noise from deep within the earth. Emerging from their houses, locals found the land rolling in waves up to 3' high and opening fissures several feet deep. The shaking lasted for 4 minutes, with the usual devastating effects to property. A strong odor of sulfur filled the air. Among the witnesses was the artist John James Audubon, who happened to be in the area. The quake radiated outward with such force that it knocked down chimneys in Cincinnati, 400 miles away, and it also was felt in Washington, DC. On January 23 and February 4, quakes of similar magnitude followed. New Madrid has been silent ever since. Such episodes have never been known to happen in the same place twice. They apparently are as random as lightning.

The Mount St. Helens eruption in Washington in 1980 was the first volcanic eruption in the lower 48 US states in >65 years. Until that time, most volcanologists thought volcanoes blew up from the top, as had happened periodically in the Hawaiian volcanoes. Mount St. Helens started its ominous rumblings on March 20, and within a week, it was erupting magma in relatively modest amounts up to 100 times a day. People initially evacuated to a distance of 8 miles, but as days passed and the rumblings failed to develop into anything dramatic, people returned to closer distances. On April 19 the mountain began to bulge, not at the top but on one side. Mount St. Helens did not have an open vent as did the Hawaiian volcanoes, so some speculate that any pressure building up inside was bound to be released dramatically and probably catastrophically. On May 18 the north side of the volcano collapsed, sending an enormous avalanche of dirt and rock rushing down the mountain slope at 150 miles an hour. It was the biggest landslide in human history and carried enough material to bury the whole of Manhattan to a depth of 400'. A minute later, its flanks severely weakened, and Mount St. Helens exploded with a force of 500 Hiroshima-sized atomic bombs, shooting out a hot cloud up to 650 miles an hour. Many people believed to be in safe areas, often far out of sight of the volcano, were overtaken. Some people were killed 18 miles away from the eruption. Mount St. Helens lost 1300' of peak, and 230 square miles of forest were devastated, enough trees to build up to 300,000 homes.

When we think of volcanoes, most of us think of the classic cone shapes of Fuji or Kilimanjaro, which are created when erupting magma accumulates in a symmetrical mound. These can form remarkably quickly. In 1943, at Parícutan, Mexico, a farmer

suddenly saw smoke rising from a patch of his land. In 1 week, that smoke patch had grown into a cone 500' high, and within 2 years it topped out at almost 1400' high and half a mile across.

All together, there are approximately 10,000 visible volcanoes on earth, all but a few hundred of them extinct. But there is a second type of volcano that doesn't produce a mountain. These are volcanoes so explosive that they burst open in a single mighty rupture, leaving behind a vast pit, the caldera. Yellowstone is of this second type. In the early 1970s, the National Aeronautics and Space Administration took some high-altitude photographs of Yellowstone, copies of which were passed to the park authorities. As soon as Bob Christiansen of the US Geological Survey group, who was working in Yellowstone, saw the photos, he realized immediately that virtually the entire park—2.2 million acres—was caldera. The eruption occurring 2 million years ago had left a crater >40 miles across, much too huge to be perceived at ground level. At some time in the past, Yellowstone must have blown up with violence far beyond the scale of anything known to humans.

Yellowstone is a super volcano. It sits on top of an enormous hot spot, a reservoir of molten rock that rises from at least 125 miles down in the earth. The heat from the hot spot is what powers all of Yellowstone's vents, geysers, hot springs, and popping mud pots. Beneath the surface is a magma chamber that is about 45 miles across, roughly the same dimensions as the park, and about 8 miles thick at its thickest point. It's like a pile of trinitrotoluene (TNT) about the size of Rhode Island reaching 8 miles into the sky. The pressure that such a pool of magma exerts on the crust above has lifted Yellowstone and about 300 miles of surrounding territory about 1700' higher than they would otherwise be. If it blew, the cataclysm would be beyond imagining.

Super plumes of the type on which Yellowstone sits are like martini glasses, thin on the way up but spreading out as they near the surface to create vast bowls of unstable magma. Some of these bowls can be up to 1200 miles across. There are about 30 active ones on the earth at the moment, and they are responsible for many of the world's best-known islands and island chains: Iceland, Hawaii, the Azores, Canary Islands, Galápagos Archipelagos, Little Pitcairn Island, and many others. All are oceanic except Yellowstone. No one has the faintest idea how or why Yellowstone's plume ended up beneath a continental plate. Only 2 things are certain. The crust at Yellowstone is thin, and the earth beneath it is hot. Where the other super volcanoes tend to bubble away steadily and in a comparatively benign fashion, Yellowstone blows explosively.

Since its first eruption 16.5 million years ago, Yellowstone has blown up about 100 times, but the most recent 3 eruptions are the ones written about. The last eruption was 1000 times greater than that of Mount St. Helens, the one before that was 280 times bigger, and the one before that was so big that nobody knows exactly how big it was, but probably at least 2500 times greater than Mount St. Helens. The Yellowstone eruption of 2 million years ago put out enough ash to bury New York State to a depth of 67' or California to a depth of 20'. The ash fall from the last Yellowstone eruption covered all or parts of 19 western states, plus parts of Canada and Mexico—nearly the whole of the USA west of the Mississippi. If crops were to grow again, the ash would have to be moved. It took thousands of workers 8 months to clear 1.8 billion tons of debris from the 16 acres of the World Trade Center site in New York. Imagine what it would take to clear Kansas.

The last super volcano eruption on earth was at Toba, in northern Sumatra, 74,000 years ago. The Toba blast was followed by 6 years of "volcanic winter," and the event is thought to have carried humans right to the brink of extinction, reducing the global population to no more than a few thousand individuals. There is some evidence to suggest that for the next 20,000 years, the total number of people on earth was never more than a few thousand at any time. The biggest blast in recent times was that of Krakatoa in Indonesia in August 1883, which made a bang that reverberated around the world for 9 days. The material ejected from Krakatoa might be thought of as the size of a golf ball; that from Mount St. Helen's, a pea; and that from Yellowstone, a huge boulder.

All of this was hypothetically interesting until 1973, when water in Yellowstone Lake in the heart of the park began to run over the banks at the lake's southern end and flooded a meadow, while at the opposite end of the lake the water mysteriously flowed away. Geologists did a hasty survey and discovered that a large area of the park had developed an ominous bulge. This was lifting up one end of the lake and causing the water to run out at the other. By 1984, the whole central region of the park—several dozen square miles—was >3' higher than it had been in 1924, when the park was last formally surveyed. Then, in 1985, the whole of the central part of the park subsided by 8". It now seems to be swelling again. Geologists realized that only one thing could cause this—a restless magma chamber. Yellowstone was not only the site of an ancient super volcano, but it was the site of an active one. It was also about this time that geologists were able to work out the cycle of Yellowstone's eruptions, which average 1 massive blow every 600,000 years. The last one was 630,000 years ago. Yellowstone is due.

Water

Chapter 18 in Bill Bryson's book, "The Bounding Main," is about water, a compound that has no taste or smell and is generally benign. But at times, water can be swiftly lethal and, depending on its state, can burn or freeze an individual. Water is everywhere. A potato is 80% water; a cow, 74%; a bacterium, 75%; a tomato, 95%; and a human, 65%, making us more liquid than solid by a margin of nearly 2:1. Water is formless and transparent, yet we long to be beside it. It has no taste, yet we love the taste of it. We travel great distances to see it in sunshine. Even though it is dangerous and drowns many thousands of people every year, we can't wait to frolic in it.

Most liquids when chilled contract by about 10%. Water does too, but only down to a point. Once it is almost ready to freeze, it begins to expand. By the time it is solid, it is almost a tenth more voluminous than it was before. Because it expands, ice floats on water. If it lacked this splendid property, ice would sink, and lakes and oceans would freeze from the bottom up. Without surface ice to hold heat in, the water's warmth would radiate away, leaving it even chillier and creating yet more ice. Soon even the oceans would freeze and almost certainly stay that way for a very long time.

Water, of course, consists of 1 oxygen atom and 2 smaller hydrogen atoms attached to it. The hydrogen atoms cling to

their oxygen host but also make casual contact with other water molecules. In a glass of water, every molecule is changing partners billions of times a second. That's why water molecules stick together to form bodies like puddles and lakes, but not so tightly that they can't be easily separated as when, for instance, one dives into a pool of water. At any given moment, only 15% of H_2O molecules are actually touching.

Water is crucial for survival. Water is so vital that it is easy to overlook that all but the smallest fraction of the water on earth is poisonous to us because of the salts within it. We need salt to live, of course, but only in very small amounts, and seawater contains about 70 times more salt than we can safely metabolize. A typical liter of seawater contains only about 2.5 teaspoons of common salt—the kind we sprinkle on food—but it also contains much larger amounts of other elements, compounds, and other dissolved solids, which collectively are known as salts. The proportions of these salts and minerals in our tissues are similar to those in seawater—we sweat and cry seawater—but we cannot tolerate them as an input. When we take in too much salt, all of our cells become dehydrated, and that circumstance can potentially lead to seizures, unconsciousness, brain damage, and renal shutdown.

There are 320 cubic miles of water on earth, and that is all we will ever get. The system is closed—nothing can be added or subtracted. The water we drink has been around doing its job since the earth was young. By 3.8 billion years ago, the oceans had achieved their present volumes.

Ninety-seven percent of all the water on earth is in the seas, the greater part of it in the Pacific, which covers half the planet and is bigger than all the land masses put together. All together, the Pacific holds 51.6% of the ocean water; the Atlantic, 23%; and the Indian Ocean, 21.2%, leaving just 3.6% to be accounted for by all the other seas. The average depth of the ocean is 2.4 miles, with the Pacific, on average, about 1000' deeper than the Atlantic and Indian Oceans. All together, 60% of the planet surface is ocean more than a mile deep. Some have suggested we would better call our planet, not Earth, but Water.

Of the 3% of earth's water that is fresh, most exists as ice sheets. Only the tiniest amount—0.036%—is found in lakes, rivers, and reservoirs, and an even smaller part—just 0.001%—exists in clouds or as vapor. Nearly 90% of the planet's ice is in Antarctica, and most of the rest is in Greenland. The ice at the South Pole is nearly 2 miles deep, and at the North Pole, it is just 15' below the surface. Antarctica alone has 6 million cubic miles of ice—enough to raise the oceans by a height of 200' if it all melted. In contrast, if all the water in the atmosphere fell as rain, evenly everywhere, the oceans would deepen by only an inch.

FEMALE PHYSICIANS

The ratio of men to women physicians in the USA was 12:1 in 1970 and 3:1 by the year 2000. The ratio is nearly 1:1 now in US medical schools. Many are crediting women with being more team-oriented than their male colleagues and being better at taking time to communicate with patients and at striking a balance between career and family (2). The nearly 80 million Baby-Boomer generation is edging into their mid 50s, and many are demanding more medical help to deal with aging. As a group, Baby Boomers are not satisfied with a prescription and quick advice. They want dialogue. That is getting more difficult, of course, as both male and female physicians are forced by health insurers to see more patients and to spend less time with them. A recent study from the University of California at Davis concluded that women physicians were more likely to take more time to counsel their patients and to order preventive screening tests.

Another study found that female physicians emphasize compassion in their work, while male physicians believe competence is more important. In the University of California at Davis study, patients of female physicians were 27% more satisfied with their physicians than were the patients of male physicians, even after adjusting for the patients' gender, age, and other demographics.

Income apparently is not quite as important to female physicians as to male physicians. The American Medical Association Center for Health Policy Research concluded that female physicians earned an average of $120,000 in 2002, whereas their male colleagues earned an average of $195,000. With an average work week of 48 hours, women physicians are less likely to push themselves into burnout than men, who clock on average 57 hours a week. The emphasis on controlling work hours and balancing work and personal concerns is at the heart of today's efforts to reduce medical errors and increase the quality of health care. Apparently, female physicians overall favor the single-payer reform for medical care in the USA. The influence of female physicians in the USA is growing, and that obviously is good.

LOW CARBS

One of the more frequent questions I get on the speaking circuit is, "What about the Atkins diet?" According to industry watchers, about 15 to 30 million Americans are on low-carbohydrate, high-protein diets that were once considered weird science (3). There are some 200 low-carbohydrate specialty shops, quasi-shrines to the late protein-diet guru, Dr. Robert Atkins. Low-carbohydrate Web sites are proliferating. According to lowcarbforlife.sugarbane.com, "Nothing tastes as good as thin feels."

Robert Atkins' first book in 1972, *Dr. Atkins' Diet Revolution: The High Calorie Way to Stay Thin Forever,* sold 15 million copies, and the updated version in 2002, *Dr. Atkins' New Diet Revolution*, has spawned numerous low-carbohydrate spin-offs. A recent one by Dr. Arthur Agatston, a cardiologist in Miami, is entitled *The South Beach Diet,* and it has already sold 1 million copies (4).

The Atkins' "lifestyle" consists of 4 phases. The first, the induction phase, is 2 weeks with a daily maximum of 20 g of carbohydrates. Chicken, turkey, and fish are fine, but no dairy is allowed except butter, cheese, and cream. The diet limits daily intake of dark-green leafy, nonstarchy vegetables. Forbidden items include caffeine, alcohol, nuts, seeds, grains, and potatoes. Eight to 10 glasses of water are recommended daily. In the second phase, the amount of carbohydrates is increased by 5 g, which is easily obtained by either a half a cup of tomato juice or 12 macadamia nuts. Once the individual is within 10 lb of the weight goal, another 10 g of carbohydrates is added daily. The goal is slow weight loss, of 1 or 2 lb a month. The last phase is when the dieting goal is reached. The low-carbohydrate diet is, nevertheless, continued. One thing that Atkins recommends is to avoid white carbohydrates, including potatoes, white bread, and white rice.

The May 2003 article in *The New England Journal of Medicine* on the Atkins' diet gave this diet a push, but evidence is lacking that this diet is useful over a long period of time. The weight loss, which occurs early, is purely a water loss. Substantial evidence indicates that the more protein we take in, the more calcium we lose in the bones. Some have suggested that the reason Dr. Atkins died after the fall was that his bones were so soft, they were unable to protect his brain adequately.

BIG TEXAN STEAK RANCH, AMARILLO, TEXAS

Big Texas Steak Ranch is the restaurant where the 72-oz sirloin steak containing about 5200 calories is served. The cost is $50 plus tax, but it can be free if it is eaten along with the large baked potato and salad in 60 minutes. Before beginning the meal, a consent form has to be signed. The contestant cannot leave the table, and if the contestant becomes sick, the contest is over. The customer pays up front. If the steak and its accompaniments are eaten in the hour, the restaurant refunds the meal 100%. Only 1 in every 5 or 6 customers actually eats all 72 oz (5).

The Big Texan was founded in 1960, and it has been in business ever since. More than 35,000 people have taken the challenge of the 72-oz steak, but no more than 6000 have engulfed it all. Past winners include a 69-year-old grandmother, an 11-year-old boy, and Frank Pastore, a pitcher for the Cincinnati Reds in the early 1980s, who set a speed record by downing the whole meal, side dishes included, in 9½ minutes. Both a husband and a wife from Nevada, each of ordinary stature and girth, have eaten the meal successfully >10 times, usually in <30 minutes. That's too much beef to eat in a lifetime, much less in 1 hour.

SALUTE TO MCDONALD'S

It is not often that fast-food chains rush in where federal watchdogs fear to tread. But that's what happened when McDonald's announced in July 2003 that it would cut antibiotic growth promoters in its poultry and beef (6). By the end of 2004, McDonald's direct suppliers, including most of its poultry producers, must phase out their use of human antibiotics, which are used to speed the development of chicken, pigs, and cattle.

Although McDonald's action should be applauded, we need stronger government regulation of antibiotic use by all farmers. Given the raft of innovative ways to fatten food animals, we should not waste medicine's vital therapies on nonhuman animals that are not even sick. In animal agriculture, small daily quantities of antibiotics boost growth, and larger amounts in somewhat shorter courses "prevent" disease. The widespread use of antibiotics, of course, is the ideal way to foster antibiotic-resistant bacteria. The bacteria we ingest in tainted food—such as salmonella, *Campylobacter*, and *Escherichia coli*—are increasingly impervious to commonly used antibiotics. Lawmakers need to ban in food animals the use of all resistance-causing antibiotics that are important to human health unless a herd or flock actually is diseased. They also need to support research on alternatives to existing growth promoters. The animals in Europe are not given antibiotics routinely. How can we be so stupid?

SEXUAL FUNCTION IN MEN >50

In 2000, Bacon and colleagues (7) from Boston, Massachusetts, mailed questionnaires to 31,742 men aged 53 to 90 years, asking about sexual function, physical activity, body weight, smoking, marital status, medical conditions, and medications. When men with prostate cancer were excluded, the prevalence of erectile dysfunction in the previous 3 months was 33%. Many aspects of sexual function (including desire, orgasm, and overall ability) decreased sharply by decade after 50 years of age. Physical activity was associated with a relatively low risk for erectile dysfunction, and obesity was associated with a higher risk. Cigarette smoking, alcohol consumption, and television viewing time also were associated with increased prevalence of erectile dysfunction. Men without a chronic medical condition who were engaged in healthy behaviors had the lowest prevalence. Thus, gentlemen, stay physically active and fit and lean.

THE LIFE-LENGTHENING POLYPILL

Heart attacks, brain attacks, and other preventable cardiovascular diseases kill or seriously affect nearly half the population in the Western world. Randomized trials show that drugs that lower low-density lipoprotein (LDL) cholesterol, blood pressure, and platelet function reduce the frequency of atherosclerotic events and stroke. Evidence that lowering serum homocysteine (with folic acid) reduces the risk of cardiovascular disease is largely observational but rather compelling. Wald and Law (8) from London, United Kingdom, propose a single pill for simultaneously lowering LDL cholesterol, systemic blood pressure, homocysteine, and platelet function. They suggest the polypill would include a statin, 3 blood pressure medicines at half dose (thiazide, beta-blocker, angiotensin-converting enzyme inhibitor, angiotensin II receptor antagonist, and/or calcium antagonist), 0.8 mg of folic acid, and 50 to 125 mg of aspirin. Wald and Law calculate that taking these medicines daily would reduce the risk of coronary events by 88% and of stroke by 80%. I agree wholeheartedly with the concept of a polypill. I take these various medicines now but as separate pills.

WEST NILE VIRUS IN DALLAS

The West Nile virus is back this year, having been identified in a dead crow, a dead blue jay, and a number of mosquitoes collected in the area. The mosquitoes collected were mostly *Culex quinquefasciatus*, a mosquito known to favor an urban domestic habitat for its breeding. Any standing water—such as that in buckets, flowerpots, pet baths, car tires, ditches, and ponds—is a potential breeding site, and its elimination or its emptying several times a week is crucial for effective control.

The West Nile virus got its name because it was first identified in the West Nile province of Uganda in 1937. It has been detected in several other countries since then. The first documented case in the USA occurred in 1999. There were 4156 human cases and 284 deaths in the USA in 2002. The Texas Department of Health reported 202 cases and 13 deaths in 2002. Dallas County reported 25 human cases and 2 deaths in 2002 (9).

The disease is transmitted by the bite of infected mosquitoes, mostly *Culex* spp, on exposed skin. *Aedes* spp may also transmit the disease. Birds are the natural host for the West Nile virus, and blood from infected birds is the source of the infection for mosquitoes. There also have been reports of West Nile virus transmission in patients who received transfusion of infected blood or an infected organ transplant, in persons who worked in

a virology laboratory with specimens, and in infants because of transplacental infection or breast milk of infected mothers.

The incubation is from 3 to 14 days (mean, 6 days). The onset of the infection is usually in the months of July, August, and September. The symptoms of the disease are nonspecific and include fever, headache, nausea, chills, malaise, rash, myalgia, arthralgia, lymphadenopathy, muscle weakness, tremors, and convulsion, as well as sometimes profound weakness, Parkinson-like tremors, and flaccid paralysis. About 1 in 50 develop meningoencephalitis, which is fatal in 10%. The disease can affect all age groups. The severity appears to be proportional to increasing age. The median age for persons with West Nile fever is about 50 years; for meningoencephalitis, about 60 years.

Serologic tests on blood and/or spinal fluid are essential to confirm the diagnosis. Serum immunoglobulin M for West Nile appears to persist for >1 year, reducing its usefulness in diagnosing acute disease. Spinal fluid immunoglobulin M persists for <50 days, making it more useful. The virus has cross-reactions with other flaviviruses, especially St. Louis virus, and this cross-reaction makes diagnosis tricky at times.

There is no specific treatment, and there is no vaccine for humans. Thus, prevention is the key and includes eliminating standing water around homes, using insect repellents containing N,N-diethyl-*m*-toluamide (DEET) and mosquito proofing of homes, and spraying larvicides and adulticides in areas with laboratory evidence of positive human cases, mosquito pools, or birds.

FREQUENT INJURIES AT HOME

According to the *USAA* magazine, 4.7 million Americans are bitten by dogs each year (10). *Dog bites* and other injuries from dogs and other domestic animals are the most frequent source of liability claims. Dog bites can mean civil liability and even criminal liability for the owner or handler.

Physicians treat about 150,000 *swimming-related* injuries each year in the USA. There are >4000 drowning deaths annually and an estimated 500 to 600 near-drownings for each drowning death. Minor swimming pool injuries include bruises and cuts, and more significant injuries include fractures, major head and neck trauma, and, in some near-drownings, brain damage requiring long-term life support. According to the National Safe Kids Campaign, typical costs for a near-drowning victim can range from $75,000 for emergency room treatment to $180,000 annually for long-term care.

According to the American Academy of Orthopaedic Surgeons, about 230,000 people are treated for *trampoline-related injuries* each year in the USA, and most of these occur on home trampolines. The greatest number of injuries is in those aged ≤14 years. While sprains, strains, and fractures are the most common injuries, more severe injuries occur, and they can mean paralysis or death. The most likely trampoline injury requiring hospitalization is an arm or leg fracture. The increase in trampoline use has led to an increase in more serious injuries, including broken necks and head trauma. The nationwide cost of trampoline injuries in the USA exceeds $4.1 billion annually.

LALEH AND LADAN BIJANI

Laleh and Laden Bijani, 29-year-old Iranian twins, were the first adult conjoined twins to undergo separation surgery, which led to their deaths in July 2003 after a 52-hour operation (11). Both deaths were apparently caused by blood loss.

Surgery separating conjoined twins is always risky because the twins often share vital organs and blood supply. Operating on adults is considered even riskier because adults tend not to heal as quickly and as easily as children. The major problem with the separation of these twins was that they shared the sagittal sinus. But should the surgery have been done? Obviously, retrospectively, the answer is no. These twins had been turned down earlier for the operation in Germany.

These ladies were intelligent, educated, engaging, and basically healthy. Both twins seemed to understand that one or both could die, and they so wanted to live separately that they were willing to risk dying. Because they were adults, their wishes were paramount. No other set of conjoined adult twins has opted for surgery. The Bijani twins simply did not want to continue living their lives the way they had been born. What Laleh and Ladan went through was an extreme example of the human quest for individuality.

Conjoined twins are estimated to occur in 1 in every 100,000 to 400,000 live births. Many have extensive health problems or die young, and a few are separated successfully (12).

CRIME RATE IN DALLAS

No wonder our emergency department is so busy. Each year the Federal Bureau of Investigation (FBI) collects data from cities in 7 categories: homicide, rape, robbery, assault, burglary, theft, and auto theft. These numbers, when calculated against population, form the crime rate. The FBI does not distinguish between violent and property crimes (13). Nearly 85% of Dallas' total crime in 2002 was a burglary, theft, or auto theft rather than a homicide, rape, robbery, or assault. Statistics reported by the nation's largest cities (New York, Los Angeles, Chicago, Houston, Dallas, Phoenix, San Antonio, and San Diego) show that for the first 6 months of 2003, Dallas had the highest crime rate. The total number of violent crimes in Dallas during that 6-month period was 8389 and total property crimes, 49,353. That was in a population of 1.2 million. These rates are higher than those of the other 7 cities. Fort Worth, Arlington, Grand Prairie, Irving, and Mesquite had higher crime rates last year than did Los Angeles and San Diego. Garland, Plano, and Carrollton topped New York's rate last year of 31 crimes per 1000 residents, but these 3 Dallas suburbs had the lowest crime rates among Texas cities of >100,000 people.

As Rod Dreher indicated, "Dallas needs Giulianizing" (14). Mr. Giuliani left office in 2001 as a national hero for his performance in the aftermath of the September 11 attacks. His greatest legacy to the city he led for 8 years was the tremendous decrease in crime, which made New York City once again a place where people wanted to live, visit, and do business. Aside from the fact that thousands of New Yorkers—especially those black and brown—are alive today because of his crime-fighting revolution, New York's economic boom in the 1990s had a lot to do with its safer streets. When Mr. Giuliani took office, New York City was awash in crime. Using innovative criminologic theories, he put more cops on the streets and changed the focus of their policing efforts. He also made the street crimes unit the locus of the New York Police Department's strategy, ordering officers

to find ways to be aggressive in policing thugs instead of merely reacting to crimes. In addition, the mayor publicly backed the New York Police Department to the hilt, something not done by previous mayors. The abrasive mayor didn't care if he was liked. He produced tangible improvements in people's lives; the public respected that and rewarded him at the voting booth. Crime plummeted, and New Yorkers returned him to office.

One important Giuliani reform was the Compstat Program, developed by the late, legendary deputy police commissioner Jack Maple. Compstat kept detailed records of the kinds of crimes committed in each precinct. Mr. Maple met weekly with precinct commanders to devise plans to target police manpower on specific areas and to hold those commanders personally responsible for the Compstat numbers in their areas.

Dallas may not be New York City but it has a crime problem, and the police chief and his demoralized officers can't control it. What Dallas needs are men and women with the guts and vision of Rudolph Giuliani.

Medicine needs to start before the wounded victims arrive at the emergency room door.

US CITIZENS IN PRISONS

According to the Bureau of Justice, America's prison population grew again in 2002 despite a declining crime rate. The inmate population in 2002 was >2.1 million, a 2.6% increase over 2001 (15). Mandatory sentences, especially for nonviolent drug offenders, may be a major reason inmate populations have risen for the past 30 years. About 1 of every 143 US residents was in federal, state, or local custody at the end of 2002. Just over 10% of all black men aged 25 to 29 were in prison in 2002. By comparison, 2.4% of Hispanic men and 1.2% of white men in the same age group were in prison. The large racial disparity, however, has not increased in the past decade.

The cost of housing, feeding, and caring for a prison inmate is roughly $20,000 a year, or about $40 billion nationwide. Construction costs are about $100,000 per cell. Drug offenders now make up over half of all federal prisoners, an increase of just over 4% compared with 2001.

Texas recently passed a drug treatment alternative law, and its prison population remained virtually unchanged from 2001 to 2002. The only way to reduce prison spending is to reduce the number of people in prison and the number of prisons, and some states are doing that.

NEWT GINGRICH ON HEALTH AND HOSPITALS

Lee Cullum recently summarized some of Newt Gingrich's views on health care in his book *Saving Lives and Saving Money* (16). According to Mr. Gingrich, 44,000 to 91,000 people die in hospitals in the USA annually due to medical errors. Two million illnesses are induced by hospitals and 1.5 million by nursing homes annually in the USA. A hospital is the only place that can make you sick and then charge you to get well again. According to Mr. Gingrich, the most dangerous place in the hospital is the intensive care unit.

A 50% reduction in prescription errors would save 9000 lives a year. Mr. Gingrich wants physicians to write their prescriptions electronically, drawing on the patient's Web-based record to check all other medications being used. That would do much to eliminate mistakes, he insisted. Mr. Gingrich wants to transform health care in the USA over the next 10 to 15 years. Central to his thinking is a personal health account for everybody, with an annual deductible contribution (often made by employers, but not necessarily) that would accumulate over the years and cover basic medical bills. Any costs above that amount would be handled by an insurance policy, and individuals would have access to group risk pools, just as large companies do. The accounts would be "personal, portable, and tax-free." The government would provide tax credits to the poor and vouchers to the destitute. Mr. Gingrich places a high reliance on people researching their own conditions on the Internet before seeing a physician. He seeks a total transformation of our health care system and believes that incremental change will be inadequate.

MEDICARE DRUG BENEFIT

The drug legislation now in a Capitol Hill committee would create a universal drug entitlement for all seniors on Medicare (17). But there is a problem: 78% of seniors already have drug coverage, mostly through former employers. More than 1 of every 3 seniors with coverage through their former employer would be dumped out of that coverage and into the new government drug program. The consequence is an increase of nearly 60% in out-of-pocket expenses under the Senate plan. Not only will >4 million seniors lose their current coverage, but an additional 4.8 million seniors who buy supplemental insurance to help with drug costs will find that the Senate bill undercuts this "Medigap" coverage. Representatives and senators have passed legislation that would exempt federal retirees, including members of the House and Senate, from the Medicare prescription bill they voted to apply to millions of senior citizens. Our elected officials seem to think government-run medicine may be satisfactory for most Americans, but clearly they want no part of their own Medicare handiwork to affect their own coverage in retirement.

MALPRACTICE REFORM

The bill before the Senate in Washington, DC, and the one being voted on in Texas, places a $250,000 limit on injured patients' awards for pain and suffering (18). Would the direct effect of restricting the size of malpractice judgments increase injustice or increase justice? I believe it's the latter, but every single Senate Democrat voted against this reform bill in Washington, DC, in July. How can one group of elected officials be 100% against this proposal and the other group essentially 100% for it? This issue is simply too big for politics. The current arrangement, whereby malpractice lawsuits are not limited, delivers justice at random in widely varying amounts or not at all, depending on the litigiousness of the patient, the ability of the lawyer, or how the judge or jury feels that particular day. It is an odd system of justice that awards millions of dollars to every 25th victim of what may or may not have been a botched operation but doesn't guarantee basic health care to anyone.

"BRIGHTS"

According to Daniel C. Dennett, a "bright" is a person with a naturalist as opposed to a supernaturalist worldview (19). Brights don't believe in ghosts, elves, the Easter bunny, or God. Brights hold a variety of views about morality, politics, and the meaning of

life, but they share a disbelief in black magic and life after death. Brights are all around. Some are physicians, nurses, police officers, schoolteachers, service personnel, sons and daughters, brothers and sisters, and scientists; in addition, some of the nation's clergy members may be closet brights. A 2002 survey by the Pew Forum on Religion and Public Life suggests that 26 million Americans are atheist or agnostic or have no religious preference.

Brights take their civic duty seriously, probably because they don't trust God to save humanity from its follies. Most brights don't play the "aggressive atheist" role, but the price is political impotence. Most politicians think they don't have to pay any lip service to brights, and most disparage the "godless" among the brights. Bright bashing is seen as a low-risk vote-getter. But is the USA a religious or a secular state? According to the constitution, the USA is a secular state that tolerates all religious and all non-religious ethical beliefs. Toleration, of course, is the key. Whatever our theology, we can firmly object when we hear family or friends sneer at atheists or agnostics or other "godless" folk.

PRESIDENT BUSH'S PHYSICAL EXAMINATION

President Bush is 57 years old, weighs 194 lb, and is a quarter inch shorter than 6'. His resting seated blood pressure is 110/62 mm Hg, and his resting heart rate is 45 beats/min (20). Of his body weight, 14.5% is fat. His total cholesterol is 167 mg/dL; LDL cholesterol, 112 mg/dL; and high-density lipoprotein cholesterol, 45 mg/dL. This President Bush may be the healthiest of any of our presidents.

HEMODIALYSIS FOR 25 YEARS

Dr. Robin Eady, a dermatologist in London, United Kingdom, began hemodialysis at age 22 in 1963 and continued that for 25 years until 1987 when he had a kidney transplant, which was successful (21). Amazing.

BOB HOPE

In 100 years, Bob Hope appeared in vaudeville, in the theater, on radio, in movies (beginning in 1940), and on television (beginning in 1949). The first of his 285 specials for NBC began in 1950, and his last one was 46 years later in 1996. Television brought Mr. Hope's comedy to far larger audiences than did his successful "Road" pictures with Bing Crosby. And those endless combat zone tours made him a hero to the boys in uniform.

Bob Hope said Dallas helped him get started on stage, and he gave Dallas a stage in return. Southern Methodist University's Bob Hope Theater, part of the Meadows School of the Arts, has seen countless theater shows, film festivals, and television productions since its dedication in 1968. Bob Hope donated >$800,000 toward the hall. Bob Hope first visited Dallas in 1925, when he played at the Majestic Theater as just another vaudeville hoofer.

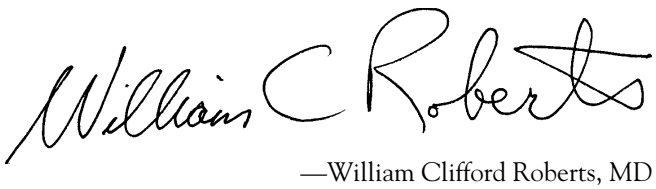
Bob Hope gave his 7 million gags to the Library of Congress in 1998. And Hope was richly rewarded for making generations of Americans smile. He became one of the entertainment industry's savviest and wealthiest businessmen, with a net worth estimated at $200 million. He told the *Washington Post* in 1982, "When I talk, E. F. Hutton listens" (22–26).

Figure. Drs. Alan Menter, Michael Emmett, and Marvin Stone, presenters at the 33rd annual meeting of the American Osler Society. No other institution had more attendees at this international meeting than Baylor.

THE AMERICAN OSLER SOCIETY IN EDINBURGH, SCOTLAND, AND MARVIN J. STONE, MD

The 33rd annual meeting of the American Osler Society was held at the Royal College of Physicians of Edinburgh from May 21 to 24, 2003. About 4 years ago, Dr. Marvin Stone invited me to attend the annual meeting of the American Osler Society; a year later I gave a paper at the annual meeting (a requirement for membership) and was elected a member. Dr. Stone also has invited other members of the Baylor staff to the annual meetings of the American Osler Society, including Drs. Michael Emmett, Robert Mennel, Barry Cooper, Alan Menter, and the late Lloyd Kitchens.

At the Edinburgh meeting, Drs. Stone, Menter, and Emmett gave outstanding presentations (*Figure*). Dr. Stone's presentation was entitled "Paul Erlich: A Pioneer in Three Disciplines"; Dr. Menter's, "Psoriasis: From 'Leprosy' to Biologic Drug Development"; and Dr. Emmett's, "Albuminuria—From Hippocrates to Henry Bence Jones." Baylor University Medical Center had more participants in that international meeting—which also included the Osler Club of London, the Japan Osler Society, and the Scottish Medical History Society—than any other medical institution in the world. Also, at the Edinburgh meeting, Dr. Stone was inducted as the new president of the society. The American Osler Society now is the most enjoyable medical meeting I attend each year, and I am indebted to Dr. Stone for providing the opportunity to participate. I am certain the other Baylor colleagues mentioned feel the same way.



—William Clifford Roberts, MD

1. Bryson BA. *The Short History of Nearly Everything*. New York: Broadway Books, 2003.
2. Carroll J. The good doctor. What does it mean for you? *American Way*, July 15, 2003.
3. Della Cava MR. Low-carb "lifestyle" goes mainstream. *USA Today*, August 19, 2003.
4. Hellmich N. It's the not-so-new diet revolution. *USA Today*, June 18, 2003.

5. Hockstader L. High-stakes venture. *Dallas Morning News,* June 28, 2003.
6. Drexler M. Cut antibiotic use in food animals. *USA Today*, July 9, 2003.
7. Bacon CG, Mittleman MA, Kawachi I, Giovannucci E, Glasser DB, Rimm EB. Sexual function in men older than 50 years of age: results from the health professionals follow-up study. *Ann Intern Med* 2003;139:161–168.
8. Wald NJ, Law MR. A strategy to reduce cardiovascular disease by more than 80%. *BMJ* 2003;326:1419–1423.
9. Dallas County Department of Health and Human Services. West Nile virus health alert. *Health Alert,* 2003.
10. USAA. When the dog bites. *USAA Magazine,* August 2003.
11. Kornblum J. Twin's deaths underscore extreme risk. *USA Today*, July 9, 2003.
12. Dreger A. Separate, together. *Wall Street Journal*, July 9, 2003.
13. Grabell M, Appleton R. Crime stats split experts. *Dallas Morning News*, August 3, 2003.
14. Drehler R. Dallas needs "Giulianizing"—and fast. *Dallas Morning News*, August 3, 2003.
15. Wire reports. Prison population rose 2.6 percent in '02. *Dallas Morning News*, July 28, 2003.
16. Cullum L. Newt has remedy for health woes. *Dallas Morning News*, July 31, 2003.
17. Hunter D, Moffit R. Medicare proposal's hypocrisy. *Dallas Morning News*, July 25, 2003.
18. Kinsley M. A painful malpractice debate. *Washington Post*, July 11, 2003.
19. Dennett DC. The bright stuff. *New York Times*, July 12, 2003.
20. Associated Press. Bush's health gets seal of approval in physical. *Dallas Morning News*, August 3, 2003.
21. Kingsbury A. Ex-dialysis patient honored for ideals. *Dallas Morning News*, June 22, 2003.
22. Bob Hope: more than a comedian, he was cultural icon. *Dallas Morning News*, July 29, 2003.
23. Sumner J. Time was right for Road movies. *Dallas Morning News*, July 29, 2003.
24. Bark E. For five decades, TV was comedian's stage. *Dallas Morning News*, July 29, 2003.
25. Sime T. Entertainer and Big D went way back. *Dallas Morning News*, July 29, 2003.
26. Wloszczyna S. A century of good times. *USA Today*, July 29, 2003.